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Energy Geostructures: Innovation in Underground Engineering

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Energy geostructures are a tremendous innovation in the field of foundation engineering and are spreading rapidly throughout the world. They allow the procurement of a renewable and clean source of energy which can be used for heating and cooling buildings. This technology couples the structural role of geostructures with the energy supply, using the principle of shallow geothermal energy. This book provides a sound basis in the challenging area of energy geostructures.

The objective of this book is to supply the reader with an exhaustive overview on the most up-to-date and available knowledge of these structures. It details the procedures that are currently being applied in the regions where geostructures are being implemented. The book is divided into three parts, each of which is divided into chapters, and is written by the brightest engineers and researchers in the field. After an introduction to the technology as well as to the main effects induced by temperature variation on the geostructures, Part 1 is devoted to the physical modeling of energy geostructures, including in situ investigations, centrifuge testing and small-scale experiments. The second part includes numerical simulation results of energy piles, tunnels and bridge foundations, while also considering the implementation of such structures in different climatic areas. The final part concerns practical engineering aspects, from the delivery of energy geostructures through the development of design tools for their geotechnical dimensioning. The book concludes with a real case study.

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About the Authors

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